

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First named Applicant: Venkata R. Jagana	Group Art Unit: 2143
Application No.: 09/686,049 (CONF 4959)	
Filed: 10/11/2000	
Title: System for host-to-host connectivity using FICON protocol over a storage area network	Examiner: LaShonda T. Jacobs
Attorney Docket No.: BEA9-2000-0005-US1	

Assistant Commissioner for Patents  
Washington, D.C. 20231

RESPONSE TO NON-COMPLIANT APPEAL BRIEF

This filing is made in response to the Notification of Non-Compliant Appeal Brief mailed on April 19, 2007. Therefore, Applicant submits herewith a revised Appeal Brief. No new substantive arguments, and so on, have been added to this revised Appeal Brief. Should there be any further questions regarding the Appeal Brief, the Examiner is encouraged to contact Michael Dryja, Applicant's representative, at the phone number listed below. A one-month extension is being filed in conjunction with this response.

Respectfully Submitted,



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**APPEAL BRIEF**

This Appeal Brief is organized in accordance with the requirements set forth in 37 CFR 41.37(c).

**Real party in interest**

The real party in interest is International Business Machines Corporation (hereinafter, "IBM"), of Armonk, New York. All applicants of the present patent application have assigned their rights to the invention to IBM.

**Related appeals and interferences**

There are no related appeals or interferences to the present patent application.

**Status of claims**

Claims 1-21, 23, 25-27, and 29 are pending in this matter. All claims stand rejected.

**Status of amendments**

Claims 1, 4, 7, 16, 19, and 25 were amended in the office action response of March 1, 2005, and entered by the Examiner in the office action of June 13, 2005. Claims 1, 7, 19, 23, 25,

and 29 were amended in the office action response of September 10, 2005, and entered by the Examiner in the final office action of December 1, 2005. Claims 22, 24, 28, and 30 were cancelled in the office action response of September 10, 2005, as well. Claims 1, 4, 7, 16, 19, and 25 were amended in the office action response of January 26, 2006, and entered by the Examiner in the office action of April 18, 2006, after the filing of a request for continuing examination by Applicant on March 17, 2006. Thus, all of the amendments made to the claims have been entered, and the claimed invention as appealed herein is as has been amended.

#### Summary of claimed subject matter

Claims 1, 7, 16, 19, and 25 are independent claims, from which the other pending claims ultimately depend. Applicant focuses on claim 1 in this appeal brief as representative of the claimed invention as rejected by the Examiner. Therefore, claim 1 is discussed most thoroughly herein. However, after this discussion of claim 1, the other independent claims 7, 16, 19, and 25 are briefly discussed.

Claim 1 is limited to a “system for communication between a first host and second host,” such as the host 14 and the host 15 of FIG. 3 of the patent application as filed. Claim 1 recites “means for communicating between a first host and a storage area network using a storage area network protocol in a non-ESCON protocol manner,” where “the storage area network includ[es] a plurality of storage devices exclusive of the first host.” The storage area network of this element of the claimed invention is, for instance, the storage area network (SAN) 17 of FIG. 3 of the patent application as filed. The storage devices “exclusive of the first host” are storage devices other than the first host, such as the storage devices 16 of FIG. 3 of the patent application as filed. This element of the claimed invention thus allows the first host, the host 14 of FIG. 3, to communicate with a SAN, such as the SAN 17 of FIG. 3. (See, for instance, p. 5, ll. 5-10 of the patent application as filed; and, p. 6, l. 27, through p. 7, l. 2)

The next element of claim 1 is similar to the first element of claim 1, and recites “means for communicating between a second host and the storage area network using the storage area network protocol in a non-ESCON protocol manner,” where “the storage devices [are] exclusive

of the second host” as well. Thus, in relation to FIG. 3 of the patent application as filed, the second host is the host 15, the SAN is the SAN 17, and the storage devices “exclusive of” (i.e., other than) the second host are the storage devices 16. (See, for instance, p. 5, ll. 5-10 of the patent application as filed; and, p. 6, l. 27, through p. 7, l. 2) What the first two elements of claim 1 is lay out the basic configuration of a SAN. You have hosts, such as the hosts 14 and 15, that communicate with the SAN, such as the SAN 17, so that, for instance, they can communicate with storage devices also connected to the SAN, such as the storage devices 16.

One inventive aspect of claim 1 is found in the third element of this claim, which recites “means for communicating directly between the first and second hosts using the storage area network protocol in a non-ESCON protocol manner without passing through a storage device.” Therefore, in relation to FIG. 3 of the patent application as filed, not only can the hosts 14 and 15 communicate with the SAN 17 to access the storage devices 16, as in the first two elements of this claim, but *the hosts 14 and 15 can also communicate with each other over the SAN 17 – i.e., using the storage area network protocol.* This is important, as such inter-host communication over a very specific type of network – a storage-area network – via usage of a SAN protocol is not taught, suggested, or disclosed by the prior art, as will be described later in this appeal brief. (See, for instance, p. 5, ll. 5-10 of the patent application as filed; and, p. 6, l. 27, through p. 7, l. 2)

However, Applicant would like to discuss this novel usage of a SAN protocol for communication between two hosts (i.e., not between a host and a storage device) a little further. Again, the idea here is that a SAN is used not only for host-to-storage device communication, but is also used for host-to-host communication. The Appellate Board in this respect is referred to FIGs. 1-3 of the patent application as filed. In FIG. 1, a typical SAN in accordance with the prior art is shown. Hosts 1 and 2 communicate over the SAN 5 with the storage devices 6, but cannot communicate with one another over the SAN 5, as is customary. For host-to-host communication to occur, what is typically accomplished in the prior art is what is shown in FIG. 2. In FIG. 2, there is one network 10 for the host 8 to communicate with the host 9, and then there is a SAN 11 so that the hosts 8 and 9 can communicate with the storage devices 12. That is, there are two

networks: the network 10, and the SAN 11. (See, e.g., p. 4, ll. 20-24 of the patent application as filed.)

Therefore, the claimed invention of claim 1 applies to FIG. 3 of the patent application as filed. In FIG. 3, hosts 14 and 15 can communicate with the storage devices 16 over the SAN 17, but very importantly, *can communicate with one another via the SAN 17 using a SAN protocol*. (See, for instance, p. 5, ll. 5-10 of the patent application as filed; and, p. 6, l. 27, through p. 7, l. 2) This is the crux of the invention insofar as the Examiner's rejections are concerned, as is discussed in more detail later in this appeal brief. What claim 1 covers, in other words, is that two hosts can communicate with each other directly, using a storage area network protocol, over a storage area network. An additional network, like the network 10 of FIG. 2, is not needed by the invention.

The other pending independent claims are similar to claim 1 in respect to this inventive aspect of the claimed invention. Claim 7, for instance, is a method claim that corresponds to the system claim of claim 1. Claim 7 is thus directed to a "method for communicating between a first host and second host," such as the hosts 14 and 15 of FIG. 3 of the patent application as filed. First, the method recites "communicating between a first host and a storage area network using a storage area network protocol in a non-ESCON protocol manner," where "the storage area network includ[es] a plurality of storage devices exclusive of the first host." In FIG. 3, then, the first host 14 communicates with the SAN 17, and the SAN 17 includes the storage devices 16 that are "exclusive of," or other than, the host 14 itself. Second, the method recites "communicating between a second host and the storage area network using the storage area network protocol in a non-ESCON protocol manner," where again "the storage devices [are] exclusive of the second host." Thus, the second host 15 of FIG. 3 communicates with the SAN 17, where the storage devices 16 are "exclusive of," or other than, the host 15 itself. Finally, the method of claim 7 recites "communicating directly between the first and second hosts using the storage area network protocol in a non-ESCON protocol manner without passing through a storage device." Thus, in relation to FIG. 3, the hosts 14 and 15 communicate with one another, where such communication does not pass through the storage devices 16 (i.e., they communicate over the

SAN 17, insofar as they using a storage area network protocol). (See, for instance, p. 5, ll. 5-10 of the patent application as filed; and, p. 6, l. 27, through p. 7, l. 2)

Independent claim 16 covers the claimed invention from the standpoint of the first host itself. Thus, claim 16 is directed to a “method for facilitating the communications of a first host.” The method first recites “communicating with a second host using a storage area network protocol in a non-ESCON protocol manner.” In relation to FIG. 3 of the patent application as filed, the first host 14 therefore communicates with the second host 15, using a storage area network protocol, and thus communicating over the SAN 17. The method of claim 16 also recites “communicating with a storage area network using the storage area network protocol in a non-ESCON protocol manner,” where the storage area network as before “includ[es] a plurality of storage devices exclusive of the first host and the second host.” In relation to FIG. 3, then, the first host 14 communicates with the SAN 17, where the SAN 17 includes the storage devices 16 apart from the hosts 14 and 15. Again, the crux of the invention here is that the hosts 14 and 15 can communicate with one another over the SAN 17 – i.e., using a storage area network protocol. (See, for instance, p. 5, ll. 5-10 of the patent application as filed; and, p. 6, l. 27, through p. 7, l. 2)

Independent claim 19 recites the same limitations as claim 1 does, except that the means in question are “in the medium,” where claim 19 is directed to an “article for communicating between a first host and a second host” that includes “a tangible recordable data storage medium.” Thus, the first means is for communicating between a first host and a SAN, such as the host 14 and the SAN 17, respectively, of FIG. 3 of the patent application as filed. The second means is for communication between a second host and the SAN, such as the host 15 and the SAN 17, respectively, of FIG. 3. The third means is “for communicating between the first host and the second host using the storage area network protocol.” Thus, the hosts 14 and 15 of FIG. 3 are able to communicate with one another over the SAN 17 – i.e., using a storage area network protocol. (See, for instance, p. 5, ll. 5-10 of the patent application as filed; and, p. 6, l. 27, through p. 7, l. 2)

Finally, independent claim 25 recites the same limitations as claim 16 does, except that the limitations are part of a means in a tangible recordable data storage medium of an article with a first host. That is, the means is “for communicating with a storage area network” (by the first host), and “with a second host using a storage area network protocol.” Therefore, in relation to FIG. 3 of the patent application as filed, the means facilitates communications from the first host 14 with the SAN 17, and also from the first host 14 with the second host 15. The host 14 communicates with the host 15 over the SAN 17 – i.e., using a storage area network protocol. (See, for instance, p. 5, ll. 5-10 of the patent application as filed; and, p. 6, l. 27, through p. 7, l. 2)

#### Grounds of rejection to be reviewed on appeal

For the purposes of this appeal, there is a single issue, and thus a single ground of rejection to be reviewed on appeal, namely, whether the US patent reference Bradley (6,769,021) in view of the US patent reference Latif (6,400,730) renders the claimed invention as to all the pending claims 1-21, 23, 25-27, and 29 obvious and unpatentable under 35 USC 103(a). Applicant submits that Bradley in view of Latif does not teach, suggest, or disclose all the claim limitations of the claimed invention, such that the claims are patentable over Bradley in view of Latif.

#### Argument

As has been noted above, Applicant is discussing claim 1 as representative of the claimed invention insofar as patentability over Bradley in view of Latif is concerned. The aspect of the claimed invention that Applicant submits is not taught, suggested, or disclosed by Bradley in view of Latif is the communication between a first host and a second host using a storage area network protocol, which means that the first and the second hosts communicate directly with one another using a storage area network. This aspect of the claimed invention is found in all the independent claims that are pending and that stand rejected.

Applicant notes that “all claim limitations must be taught or suggested.” (MPEP sec. 2143.03) That is, “[t]o establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.” (Id., citing *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)) Applicant is thus contending herein that Bradley in view of Latif does not teach, suggest, or disclose all the claim limitations of the claimed invention, specifically the communication between two hosts over a storage area network using a SAN protocol, such that the claimed invention is not *prima facie* obvious over Bradley in view of Latif.

The Examiner has indicated that Bradley teaches, discloses, or otherwise suggests all the aspects of the claimed invention, with the exception of the non-ESCON protocol manner limitation (which is not at issue here). (See, e.g., office action of April 18, 2006, pp. 2-3.) Applicant respectfully disagrees with the Examiner in this respect. In particular, Bradley does not disclose a storage area network with which the first and the second hosts communicate using a storage area network protocol. Furthermore, Bradley does not disclose the first and the second hosts communicating directly with one another using the storage area network protocol. Applicant now discusses this in detail.

Applicant notes that he is very much cognizant that the rejection has been proffered under 35 USC 103(a) over a combination of two references, Bradley and Latif. While it may appear that Applicant is improperly attacking this rejection by attacking a single reference, this is not the case. Rather, Applicant is showing how Bradley does not teach the limitations of the claimed invention that the Examiner says that Bradley does, such that Bradley in combination with Latif does not teach all the limitations of the claimed invention. In other words, Applicant is attacking the overall combination of Bradley with Latif by particularly showing how Bradley does not disclose the aspects of the claimed invention that the Examiner says Bradley discloses. Insofar as Bradley does not disclose these aspects of the claimed invention, then the obviousness rejection made by the Examiner that relies upon Bradley disclosing these aspects of the claimed invention necessarily fails.

*What a SAN “is”*



Applicant would like to first take a moment to explain what a storage-area network (SAN) “is,” since the claimed invention uses this terminology explicitly. The knowledge that one of ordinary skill within the art possesses as to SAN’s is that SAN’s are used for connecting hosts to storage systems, and storage systems to one another. At the time the patent application was filed, there remained an industry need for high-speed host-to-host connectivity comparable to SAN’s. One of ordinary skill within the art, in other words, does not have the knowledge that SAN’s can be used for direct host-to-host communication, as opposed to host-to-storage system and storage system-to-storage system communication. Applicant references in this respect the previously filed Computer Desktop Encyclopedia entry for SAN, which was filed in an information disclosure statement in conjunction with the office action response of September 10, 2005. This entry discusses connecting servers (i.e., hosts) to disk storage (i.e., storage systems), and never discusses SAN’s being used to connect servers to servers for communication among the servers directly. Applicant thus submits that a SAN, as understood by one of ordinary skill within the art at the time of filing the present patent application, is for host-to-storage system and storage system-to-storage system communication, and not for host-to-host communication. (At the very least, the Examiner has not provided any evidence to the contrary – that a SAN as understood by one of ordinary skill within the art at the time of filing the present patent application could be used for host-to-host communication.)

*What Bradley teaches such that Bradley in view of Latif does not teach the claimed invention*

Now, the Examiner has stated that Bradley substantially teaches the first element of the claimed invention, as to means for communicating between a first host *and a storage area network using a storage area network protocol*, in column 1, lines 60-67, and column 2, lines 1-2. (Final office action of September 28, 2006, pp. 2-3) The Examiner has stated that Bradley substantially teaches the second element of the invention, as to means for communicating between a second host *and the storage area network using a storage area network protocol*, also in column 1, lines 60-67, and column 2, lines 1-2. (Id.) Finally, the Examiner has stated that Bradley substantially teaches the third element of the claimed invention, as to means for

communicating directly between the first and second hosts using the storage area network protocol, also in column 1, lines 60-67, and column 2, lines 1-2. (Id.) That is, the Examiner has relied upon column 1, lines 60-67, and column 2, lines 1-2, of Bradley as substantially teaching all three elements of the claimed invention: each of a first host and a second host communicating with *a storage area network using a storage area network protocol*, and the first and second hosts communicating directly with one another using the storage area network protocol.

Applicant respectfully submits, however, that Bradley does not disclose: (1) any type of storage area network, and, (2) any type of communication using a storage area network protocol. The relied-upon excerpt of Bradley, for instance, discloses the following:

FIG. 1 shows a prior art subnet 100 with hosts 102a and 102b connected to the subnet 100. Also connected to the subnet 100 are computers (e.g., having SCSI host adapters or the like) 104a and 104b and associated storage nodes (i.e., RAID device) 106a and 106b. The subnet 100 is a shared fabric environment which allows communication between all users connected to the subnet 100. The hosts 102a and 102b each contain NIC's or similar communication circuitry which facilitate communication between the hosts 102a and 102b and the subnet 100. As such, the hosts 102a and 102b are able to communicate with each other and with the other devices on the subnet 100, such as the storage nodes 106a and 106b.

(Col. 1, l. 59, through col. 2, l. 4) This excerpt does not say anything about a storage area network, nor a storage area network protocol. Applicant respectfully submits that the confusion as to Bradley vis-à-vis the claimed invention lies in the fact that Bradley talks about hosts 102a and 102b communicating with storage nodes 106a and 106b. However, just because there are storage nodes/devices on a network that a host can communicate with does not mean: (1) that the network is *a storage area network*, to which the claimed invention is particularly limited, and which is a particular type of a network as has been noted above; or, (2) that the hosts (in particular) directly communicate with one another using *storage area network protocol*, to which the claimed invention is also particularly limited, and which is a particular type of network protocol employed in SAN's.

Indeed, Bradley prior to this excerpt discusses networks as follows.

Today's computers are becoming more interactive with other computers in a networking environment. This includes the ability for computers to communicate

with other computers on a given network, such as a local area network (LAN). . .

Computers typically communicate over a network through host adapters (e.g., network interface cards "NICs") that allow the computer to interface with the local area networks. The NICs can implement different types of network technologies such as Ethernet, ATM (Asynchronous Transfer Mode), Fibre Channel, and the like. Furthermore, ATM is able to integrate various communication technologies such as LAN and WAN (wide area network) and other voice and transmission networks, thereby creating a unified digital network, or fabric, where all the previously mentioned networks are accessible by one host. Through the local area networks and ATM, hosts are able to communicate with other hosts and any shared peripheral devices associated with other hosts, such as a host computer's RAID device.

(Col. 1, ll. 27-53) Here, Bradley discusses representative type networks, including LAN's and WAN's. LAN's and WAN's are different than SAN's, however, which are particular types of networks. As has been discussed above, a SAN is used within the prior art to communicatively couple hosts to storage devices. The invention, by comparison, novelly uses a SAN for hosts to communicate directly with one another.

The other reference relied upon by the Examiner, Latif, in fact discusses the differences between LAN's and SAN's:

In enterprise computing environments, it is desirable and beneficial to have multiple servers able to directly access multiple storage devices to support high bandwidth data transfers, system expansion, modularity, configuration flexibility and optimization of resources. In conventional computing environments, such access is typically provided via file system level Local Area Network (LAN) connections, which operate at a fraction of the speed of direct storage connections. As such, access to storage systems is highly susceptible to bottlenecks.

Storage Area Networks (SANs) have been proposed as one method of solving this storage access bottleneck problem. By applying the networking paradigm to storage devices, SANs enable increased connectivity and bandwidth, sharing of resources, and configuration flexibility. The current SAN paradigm assumes that the entire network is constructed using Fibre Channel switches. Therefore, *most solutions involving SANs require implementation of separate networks: one to support the normal LAN and another to support the SAN*. The installation of new equipment and technology, such as new equipment at the storage device level (Fibre Channel interfaces), the host/server level (Fibre Channel

adapter cards) and the transport level (Fibre Channel hubs, switches and routers), into a mission-critical enterprise computing environment could be described as less than desirable for data center managers, as it involves replication of network infrastructure, new technologies (i.e., Fibre Channel), and new training for personnel. Most companies have already invested significant amounts of money constructing and maintaining their network (e.g., based on Ethernet and/or ATM). Construction of a second high-speed network based on a different technology is a significant impediment to the proliferation of SANs.

(Col. 1, ll. 26-58) Thus, a LAN or WAN is different than a SAN, as evidenced by the Computer Encyclopedia entry noted above, and as demonstrated by Latif. Therefore, (1) where the Examiner relies upon Bradley as teaching aspects of the claimed invention relating to communication with a storage area network using a storage area network protocol, and to direct communication between two hosts using the storage area network protocol; and, (2) where Bradley is silent as to a SAN and a SAN protocol, and indeed discloses other types of networking technologies, Bradley in view of Latif cannot be considered as disclosing the claimed invention.

*Additional comments as to Bradley in view of Latif*

Applicant also parenthetically notes the differences between the claimed invention and what Bradley in view of Latif “*at best*” can be considered as disclosing. The following discussion is not particularly relevant to the patentability of the claimed invention over Bradley in view of Latif, since Bradley in particular does not teach the aspects of the claimed invention that it has been relied upon as teaching. However, this discussion is presented to give the Appellate Board further guidance as to what the invention is, and more importantly how it differs from approaches disclosed in the prior art, such as in Latif.

Now, as has been noted, the invention novelly uses a SAN for direct host-to-host communicating using a SAN protocol. As such, you can use a single network – a SAN – for both host-to-host communication and host-to-SAN/storage device communication; thus, you do not need a separate LAN or other type of network for host-to-host communication. By comparison, Bradley teaches a conventional network for host-to-host communication, as has been described.

Furthermore, Latif approaches a different problem with a different solution. Latif says that if you already have a LAN/WAN, it can be expensive to add on a separate SAN for communication. Therefore, Latif discloses that you can “integrate” or “overlay” a SAN onto an existing LAN/WAN topology so that you do not have a separate LAN/WAN and a separate SAN, but rather a LAN/WAN with an integrated/overlaid SAN. (See col. 2, ll. 15-33.) Latif refers to the existing LAN/WAN topology as an Internet Protocol (IP) network (col. 2, ll. 22-24), which makes complete sense, since LAN’s and WAN’s are also commonly called IP networks, since they use an IP networking protocol.

Therefore, what Latif does to leverage existing LAN/WAN/IP network topologies to overlay or integrate a SAN thereover or therewith is to embed the SAN protocol into the typical IP protocol, resulting in a hybrid protocol called Storage over Internet Protocol, or SoIP. (See col. 6, ll. 6-22.) This is an interesting approach, but is not relevant to the claimed invention. SoIP is not a SAN protocol. Rather, SoIP *at best* can be considered a hybrid-SAN protocol, insofar as it relies upon a non-SAN protocol, the IP protocol, to provide for SAN-type communications.

More importantly and significantly, perhaps, it would not make sense (i.e., there is no motivation) to combine the Latif approach to overlaying or integrating a SAN onto or with a conventional LAN/WAN, like that of Bradley, in a way that provides for direct host-to-host communication using a SAN protocol, or even a hybrid-SAN protocol, like SoIP. Here’s why. Bradley allows for hosts to communicate with one another via a conventional LAN/WAN protocol, like the IP networking protocol. Now, Latif says you can add in a SAN to such a conventional LAN/WAN by encapsulating SAN-type communications with a hybrid-SAN protocol, like SoIP, which allows the existing IP network and networking protocol to be used. As such, for instance, hosts can communicate with storage devices on the SAN using this hybrid-SAN protocol. However, it would make no sense for hosts to directly communicate with one another using this hybrid-SAN protocol for direct host-to-host communication. Rather, the hosts, per Bradley and as is conventional, already communicate with one another perfectly well using the conventional IP networking protocol. There is thus no motivation to add in additional complexity to have the hosts also use the hybrid-SAN protocol, where both hosts already “know” the

conventional IP networking protocol, and this conventional protocol means that there is less networking overhead, etc., insofar as you do not have to take IP communications, encapsulate them into SoIP data packets, and then send them over an IP network, since you can just send the IP communications over the IP network in the first place!

That is, the combination of Bradley in view of Latif has a different “starting point” than the claimed invention. In the claimed invention, you are solving a problem where you have only a SAN, and want to have a way for hosts to communicate with one another over the SAN, by not having to “add in” a conventional LAN/WAN/IP network. By comparison, with Bradley in view of Latif, you start with a conventional LAN/WAN/IP network, and then want to “overlay” or “integrate” a SAN without adding a separate SAN. Thus, the problem answered by the claimed invention is, “if you only have a SAN, how can you have non-storage hosts communicate with each other, in addition to communicating with storage devices on the SAN?” By comparison, the problem answered by Bradley in view of Latif is “if you only have a LAN/WAN/IP network, how can you add in a SAN for communication with SAN-type storage devices without having to build a completely new network?” In the former, the hosts do not have any way to communicate with one another already, hence the invention’s approach of using a SAN protocol to provide for direct host-to-host communication over the SAN. In the latter, the hosts already have a way to communicate with one another already, via the LAN/WAN/IP network, hence Bradley in view of Latif’s usage of a non-SAN protocol – the IP networking protocol – in a way that allows SAN-type storage devices to communicate with the hosts in a SAN-hybrid way. However, in the latter, the hosts already are able to communicate with one another, so there is no motivation to have them communicate in a non-standard way (via SoIP), where this non-standard way is wholly described as pertaining to SAN-type storage device communication.

For all of these reasons, therefore, Applicant submits that the pending claims are patentable over Bradley in view of Latif.

Conclusion

Applicant believes that the pending claims are in condition for allowance, and requests that they so be allowed, for the reasons described above.

Respectfully Submitted,



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Claims Appendix: Listing of claims on appeal

1. (previously presented) A system for communication between a first host and second host comprising:

means for communicating between a first host and a storage area network using a storage area network protocol in a non-ESCON protocol manner, the storage area network including a plurality of storage devices exclusive of the first host;

means for communicating between a second host and the storage area network using the storage area network protocol in a non-ESCON protocol manner, the storage devices exclusive of the second host; and

means for communicating directly between the first and second hosts using the storage area network protocol in a non-ESCON protocol manner without passing through a storage device.

2. (original) The system of claim 1, wherein the storage area network protocol is a FICON protocol.

3. (original) The system of claim 1, wherein the means for communicating comprises:

means at the first host for translating between the storage area network protocol and a host-to-host communications protocol selected from the group consisting of TCP/IP and SNA.

4. (previously presented) A system for facilitating the communications of a first host comprising:

means for communicating with a second host using a storage area network protocol in a non-ESCON protocol manner; and

means for communicating with a storage area network using the storage area network protocol in a non-ESCON protocol manner, the storage area network including a plurality of storage devices exclusive of the first host and the second host.



5. (original) The system of claim 4, wherein the storage area network protocol is a FICON protocol.
6. (original) The system of claim 4, wherein the means for communicating comprises:  
means for translating between the storage area network protocol; and  
communications protocol selected from the group consisting of TCP/IP and SNA.
7. (previously presented) A method for communicating between a first host and second host comprising:  
communicating between a first host and a storage area network using a storage area network protocol in a non-ESCON protocol manner, the storage area network including a plurality of storage devices exclusive of the first host;  
communicating between a second host and the storage area network using the storage area network protocol in a non-ESCON protocol manner, the storage devices exclusive of the second host; and  
communicating directly between the first and second hosts using the storage area network protocol in a non-ESCON protocol manner without passing through a storage device.
8. (original) The method of claim 7, wherein the storage area network protocol is a FICON protocol.
9. (original) The method of claim 7, wherein the step of communicating between the first and second hosts comprises:  
the first host translating between the storage area network protocol and a host-to-host communications protocol.

10. (original) The method of claim 9, wherein the host-to-host communications protocol is TCP/IP.

11. (original) The method of claim 10, wherein the storage area network protocol is a FICON protocol.

12. (original) The method of claim 11, wherein the step of communicating directly between the first and second hosts comprises:

- encapsulating TCP/IP packets from the first host in 8232 protocol frames;
- transmitting the 8232 protocol frames to the second host using the FICON protocol; and
- decapsulating the TCP/IP packets from the 8232 protocol frames at the second host.

13. (original) The method of claim 8, wherein the step of communicating directly between the first and second hosts supports a high-speed file transfer application.

14. (original) The method of claim 13, wherein the file transfer application is supported by 3088 emulation.

15. (original) The method of claim 9, where the host-to-host protocol is SNA.

16. (previously presented) A method for facilitating the communications of a first host comprising:

- communicating with a second host using a storage area network protocol in a non-ESCON protocol manner; and

- communicating with a storage area network using the storage area network protocol in a non-ESCON protocol manner, the storage area network including a plurality of storage devices exclusive of the first host and the second host.

17. (original) The method of claim 16, wherein the storage area network protocol is a FICON protocol.

18. (original) The method of claim 16, wherein the steps for communicating comprise:  
translating between the storage area network protocol and a communications protocol selected from the group consisting of TCP/IP and SNA.

19. (previously presented) An article for communicating between a first host and a second host comprising:

a tangible recordable data storage medium;

means in the medium for communicating between a first host and a storage area network using a storage area network protocol in a non-ESCON protocol manner, the storage area network including a plurality of storage devices exclusive of the first host;

means in the medium for communicating between a second host and the storage area network using a storage area network protocol in a non-ESCON protocol manner, the storage devices exclusive of the second host; and

means in the medium for communicating between the first host and the second host using the storage area network protocol in a non-ESCON protocol manner.

20. (original) The article of claim 19, wherein the storage area network protocol is a FICON protocol.

21. (original) The article of claim 19, wherein the means in the medium for communicating comprises:

means in the medium at the first host for translating between the storage area network protocol; and

a host-to-host communications protocol selected from the group consisting of TCP/IP and SNA.

22. (cancelled)

23. (previously presented) The article of claim 19, wherein the medium is selected from the group consisting of magnetic, optical, biological and atomic data storage media.

24. (cancelled)

25. (previously presented) An article for communicating with a first host comprising:  
a tangible recordable data storage medium; and  
means in the medium for communicating with a storage area network, and with a second host using a storage area network protocol in a non-ESCON protocol manner, the storage area network including a plurality of storage devices exclusive of the first host and the second host.

26. (original) The article of claim 25, wherein the storage area network protocol is a FICON protocol.

27. (original) The article of claim 25, wherein the means in the medium for communicating comprises:  
means in the medium for translating between the storage area network protocol; and  
means in the medium for a host-to-host communications protocol selected from the group consisting of TCP/IP and SNA.

28. (cancelled)

29. (previously presented) The article of claim 25, wherein the medium is selected from the group consisting of magnetic, optical, biological and atomic data storage media.

30. (cancelled)

Evidence Appendix

(No evidence was submitted pursuant to Rules 130, 131, and 132, and therefore, this section is blank.)

Related Proceedings Appendix

(There are no related proceedings to this patent application, and therefore, this section is blank.)